

CLAIMS :

1. A video encoding method applied to an input sequence of frames in which each frame is subdivided into blocks of arbitrary size, said method comprising for at least a part of said blocks of the current frame the steps of :

5 - generating on a block basis motion-compensated frames, each one being obtained from each current original frame and a previous reconstructed frame ;

- generating from said motion-compensated frames residual signals ;

10 - using a so-called matching pursuit (MP) algorithm for decomposing each of said generated residual signals into coded dictionary functions called atoms, the other blocks of the current frame being processed by means of other coding techniques ;

- coding said atoms and the motion vectors determined during the motion compensation step, for generating an output coded bitstream ;

15 said method being such that, when using said MP algorithm, any atom acts only on one block B at a time, said block-restriction leading to the fact that the reconstruction of a residual signal f is obtained from a dictionary that is composed of basis functions $g_{\gamma_n}|_B$ restricted to the block B corresponding to the indexing parameter γ_n , according to the following 2D spatial domain operation :

$$g_{\gamma_n}|_B(i, j) = g_{\gamma_n}(i, j) \text{ if pixel } (i, j) \in B$$

$$g_{\gamma_n}|_B(i, j) = 0 \text{ otherwise (i.e. } (i, j) \notin B \text{).}$$

20 2. A video encoding device applied to an input sequence of frames in which each frame is subdivided into blocks of arbitrary size, said device being applied to at least a part of said blocks of the current frame and comprising :

25 - means for generating on a block basis, by means of a motion compensation step, motion-compensated frames, each one being obtained from each current original frame and a previous reconstructed frame ;

- means for generating from said motion-compensated frames residual signals ;

30 - means for performing a so-called matching pursuit (MP) algorithm for decomposing each of said generated residual signals into coded dictionary functions called atoms, the other blocks of the current frame being processed by means of other coding techniques ;

- means for coding, for each concerned block, said atoms and the motion vectors determined during the motion compensation step, for generating an output coded bitstream ;

5 said device being such that, when using said MP algorithm, any atom acts only on one block B at a time, said block-restriction leading to the fact that the reconstruction of a residual signal f is obtained from a dictionary that is composed of basis functions $g_{\gamma_n}|_B$ restricted to the block B corresponding to the indexing parameter γ_n , according to the following 2D spatial domain operation :

$$g_{\gamma_n}|_B(i, j) = g_{\gamma_n}(i, j) \text{ if pixel } (i, j) \in B$$

$$10 \quad g_{\gamma_n}|_B(i, j) = 0 \text{ otherwise (i.e. } (i, j) \notin B \text{).}$$

3. A video encoding device according to claim 2, characterized in that the quantized inner product p_n of a dictionary element is reweighted as :

$$p_n = \frac{\left\langle f - \sum_{k=1}^{k=n-1} \hat{p}_k \cdot g_{\gamma_k}|_B, g_{\gamma_n}|_B \right\rangle}{\sqrt{\left\langle g_{\gamma_n}|_B, g_{\gamma_n}|_B \right\rangle}}$$

15 4. A video decoding method applied to a bitstream coded by means of a video coding method according to claim 1, said decoding method, comprising, for the concerned blocks, the steps of :

- decoding the coded atom parameters and motion vectors contained in said code bitstream ;

20 - reconstructing from said decoded atom parameters the residual signals ;

- generating motion compensated signals from said decoded motion vectors ;

- generating video signal reconstructed blocks by summation of said residual signals and said motion compensated signals.

25 5. A video decoding device applied to a bitstream coded by means of a video encoding device according to claim 2, said decoding device being applied to the concerned blocks and comprising :

- means for decoding the coded atom parameters and motion vectors contained in said coded bitstream ;

- means for reconstructing from said decoded atom parameters the residual signals ;

- means for generating motion compensated signals from said decoded motion vectors ;
- means for generating video signal reconstructed blocks by summation of said residual signals and said motion compensated signals.